Estuarine Detection of PIT-Tagged Juvenile Salmonids Using Pair-Trawls, 2007

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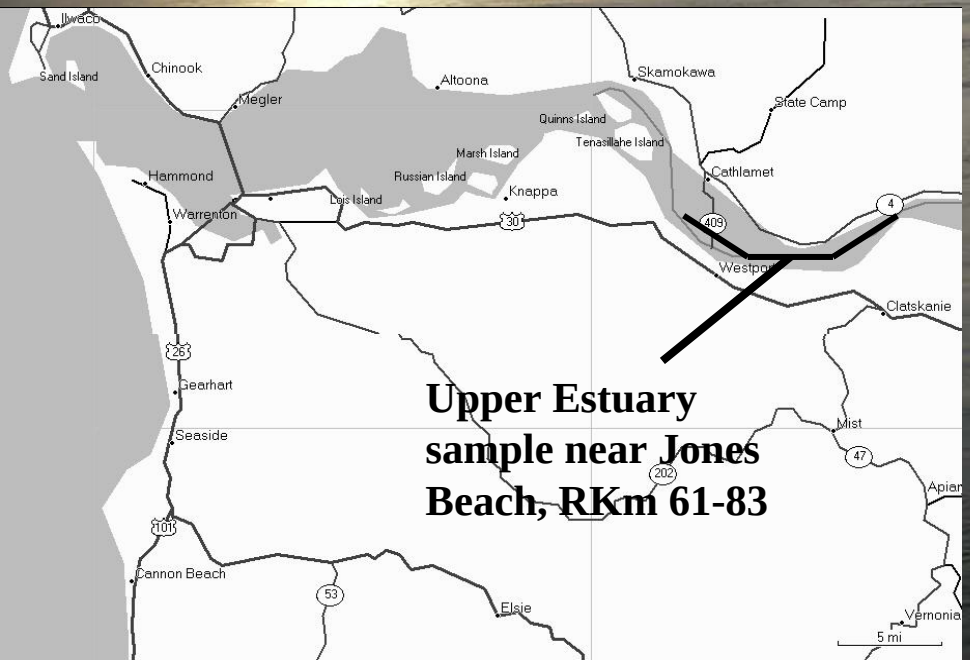


Upper Estuary sample near Jones Beach, RKm 61-83

“Flush”

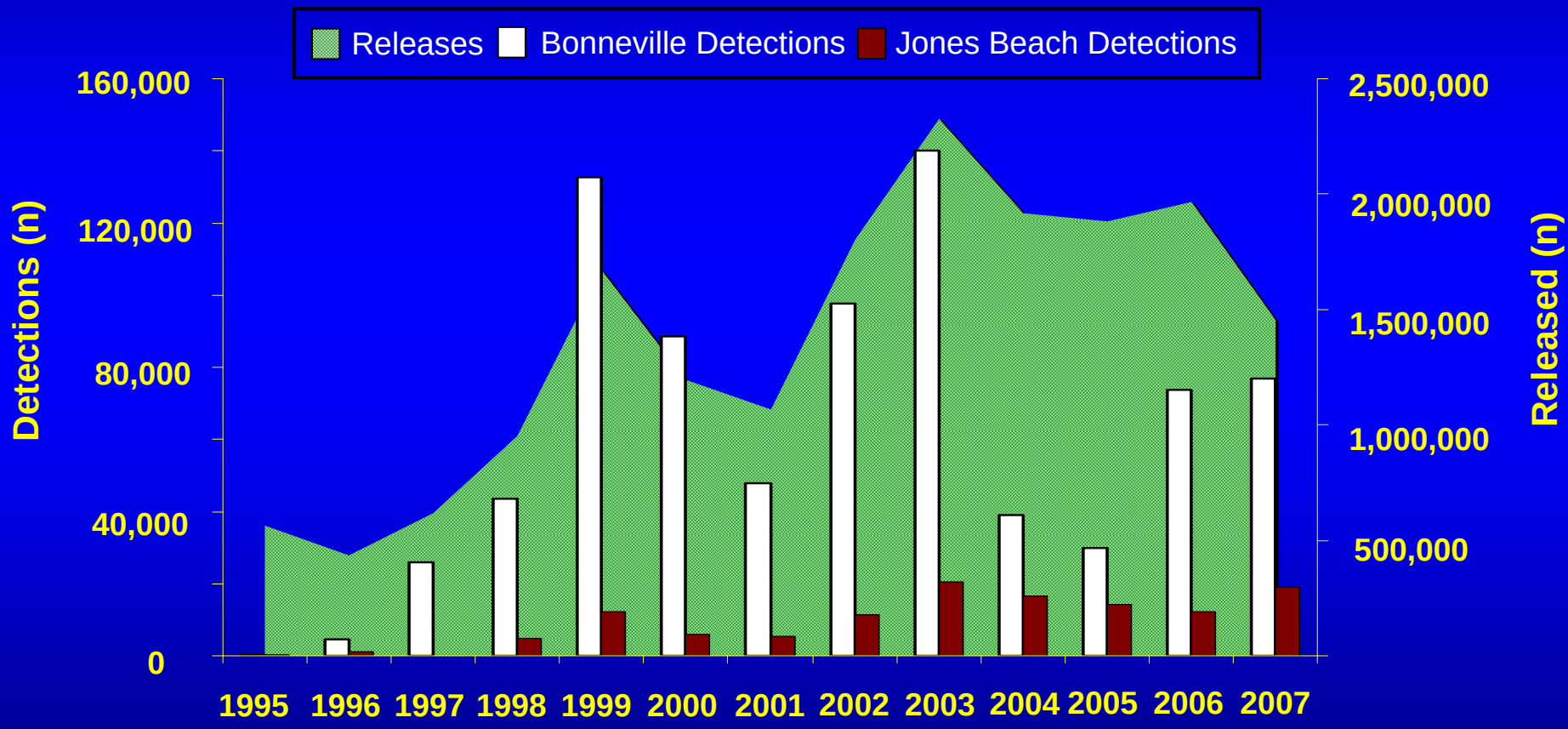
Photo by Luther Way

Objectives 2007

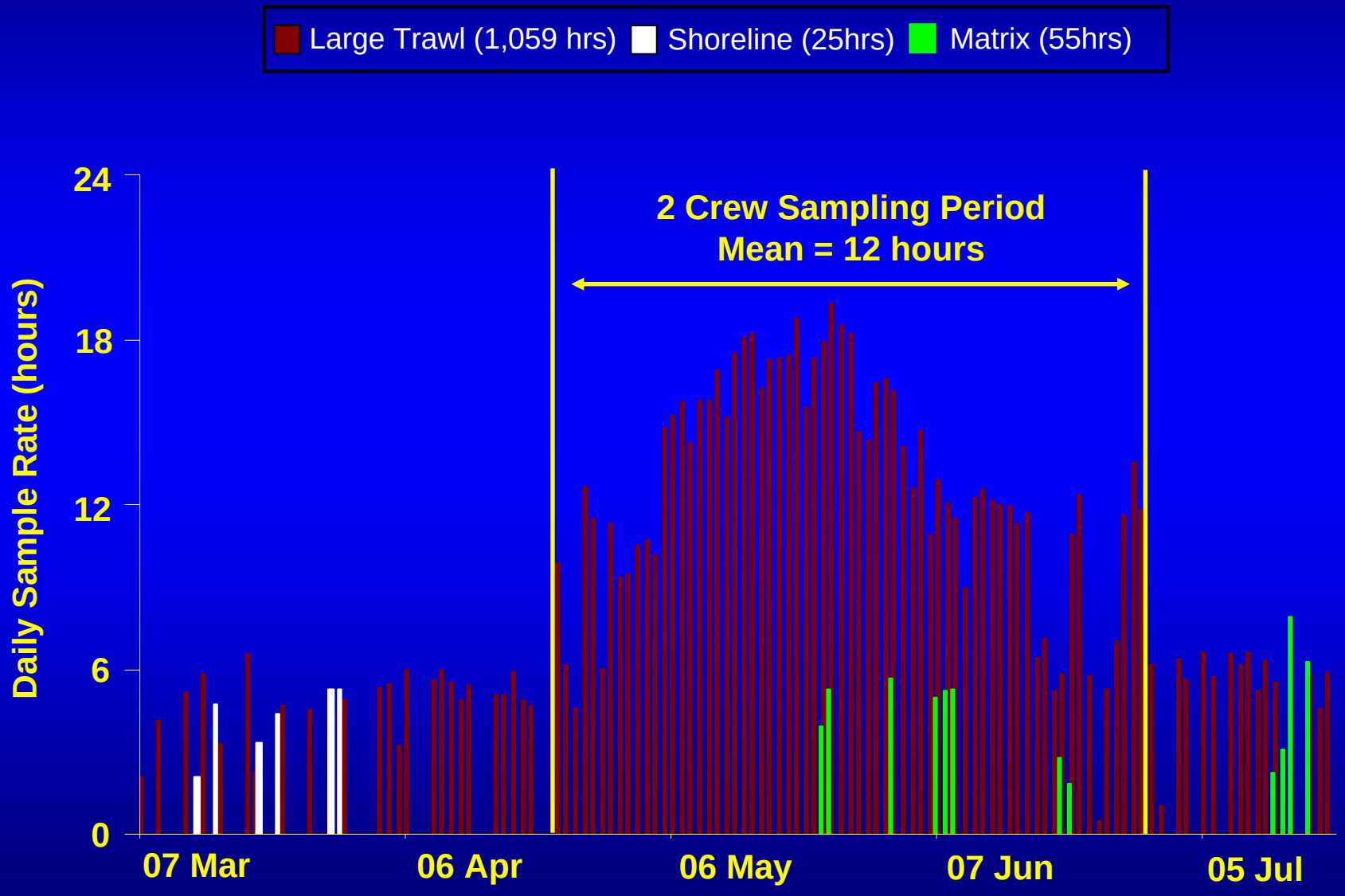
- Provide data to complete reach survival estimates for yearling salmonids for the entire Columbia River hydropower system.
- Sample in the fall, targeting Snake River Fall Chinook salmon (cancelled tagging).
- Continue development of a magnitude larger Pit-tag antenna, the “Matrix” used to increase detection efficiency via faster trawling speed.

Columbia Basin PIT tags

Columbia Basin PIT tag Releases and Detections at Bonneville Dam and Jones Beach (Rkm 75)



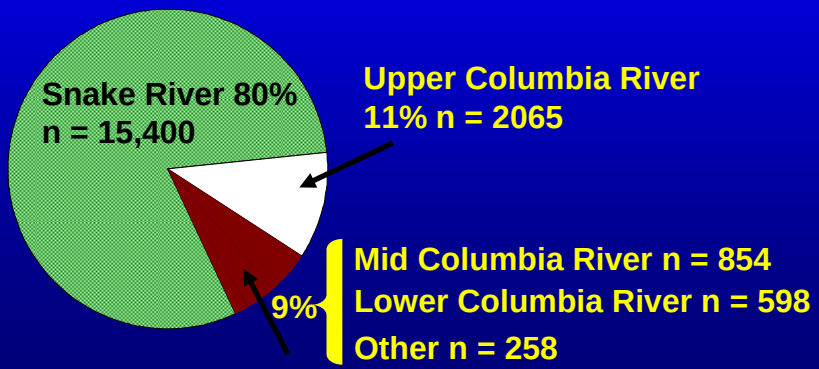
Daily Sample Effort at Rkm 75



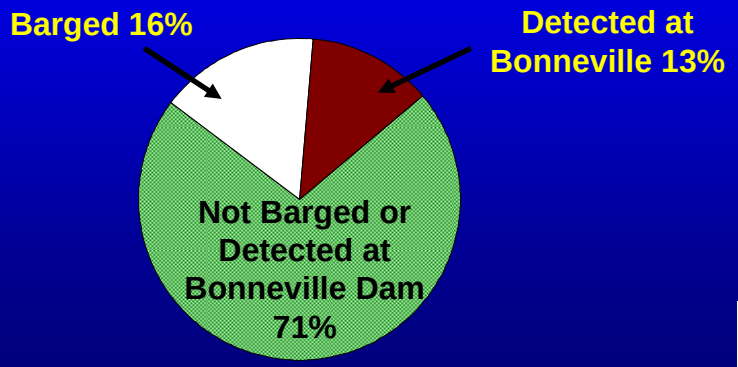
Detections By Species/Run and History

Large Trawl Jones Beach Detections 2007				
Species/run	Hat.	Wild	Unk.	Total
Spring/summer Chinook salmon	12,358	1,854	107	14,319
Fall Chinook salmon	471	31	78	580
Coho salmon	270	0	20	290
Steelhead	2,165	1,321	6	3,492
Sockeye	214	32	0	246
Searun Cutthroat	0	0	0	0
Unknown	0	0	259	259
Grand total	15,478	3,238	470	19,186

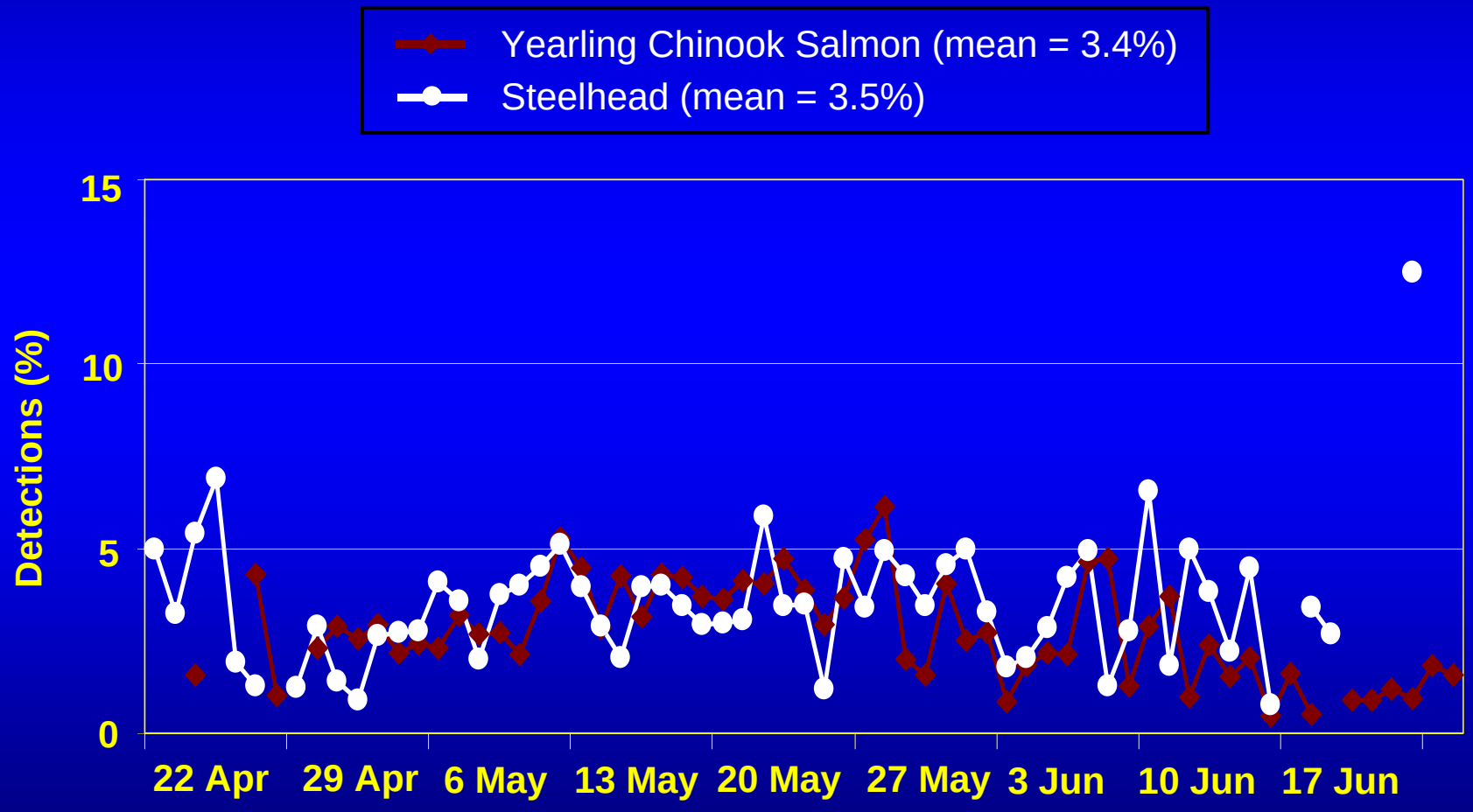
Source of Juveniles Detected in the Estuary 2007 n=19,186



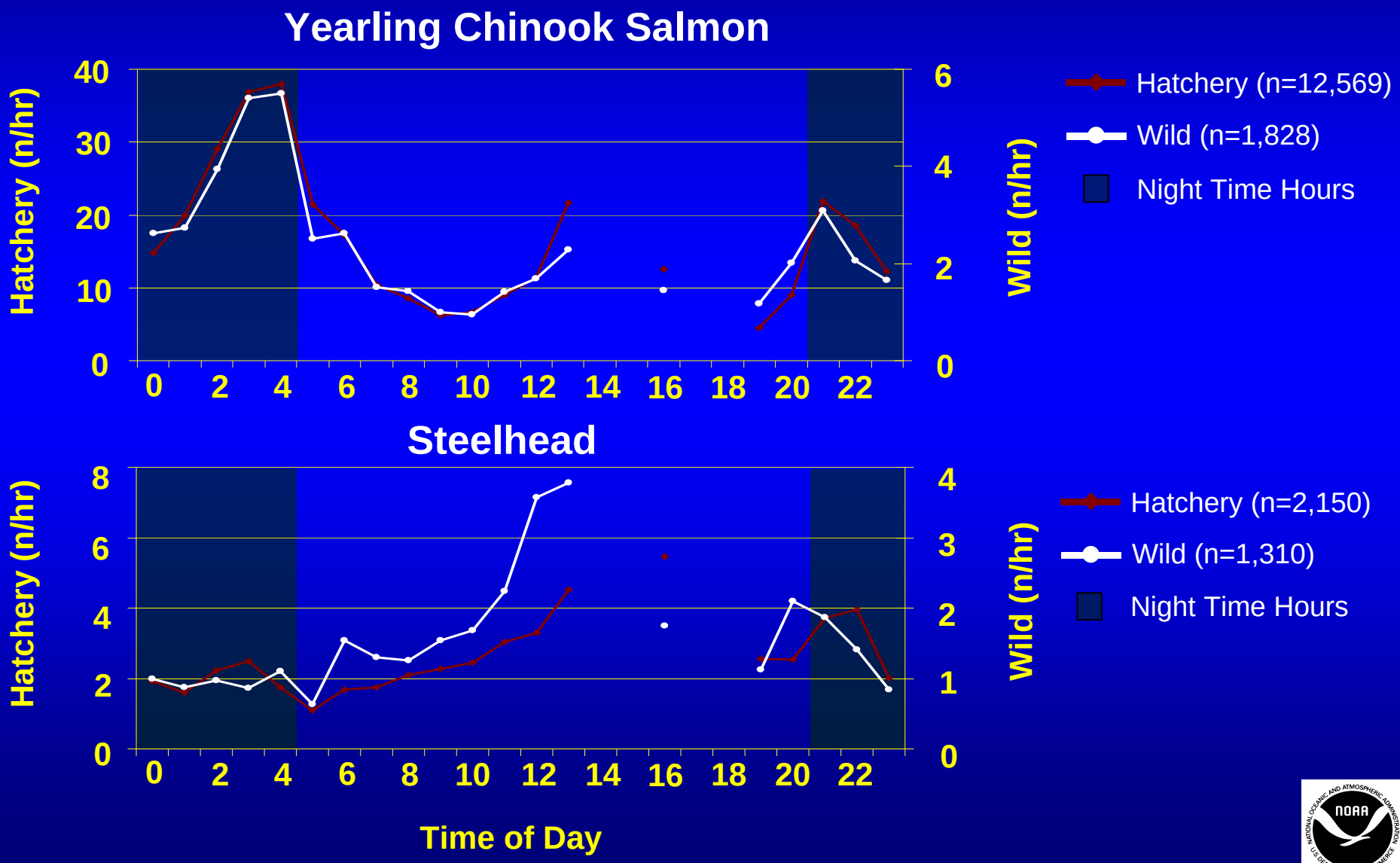
History of Juvenile Salmonids Detected in the Estuary n=19,186



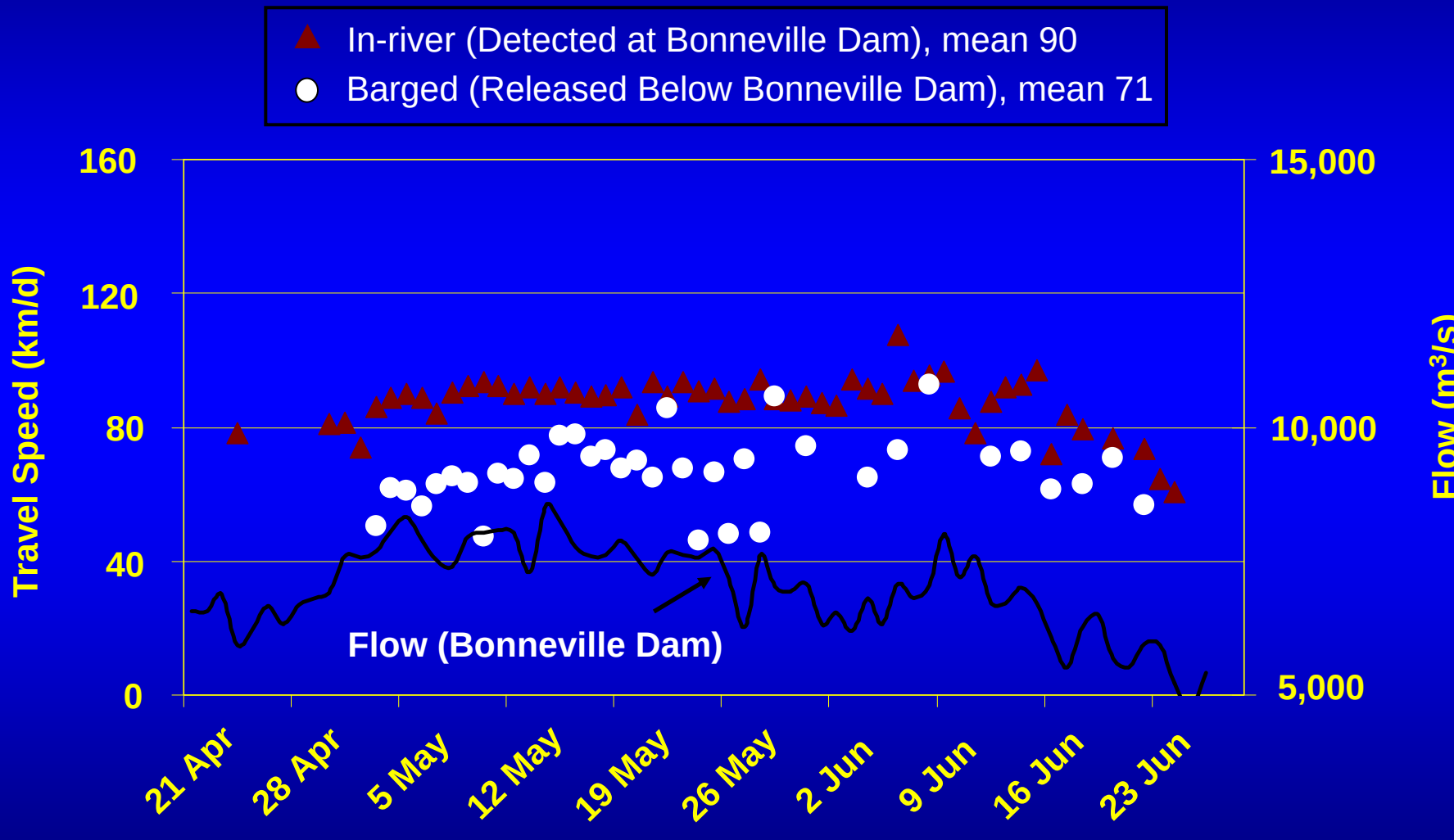
Estuary Detections of Yearling Chinook Salmon and Steelhead Previously Detected at Bonneville Dam, 2007



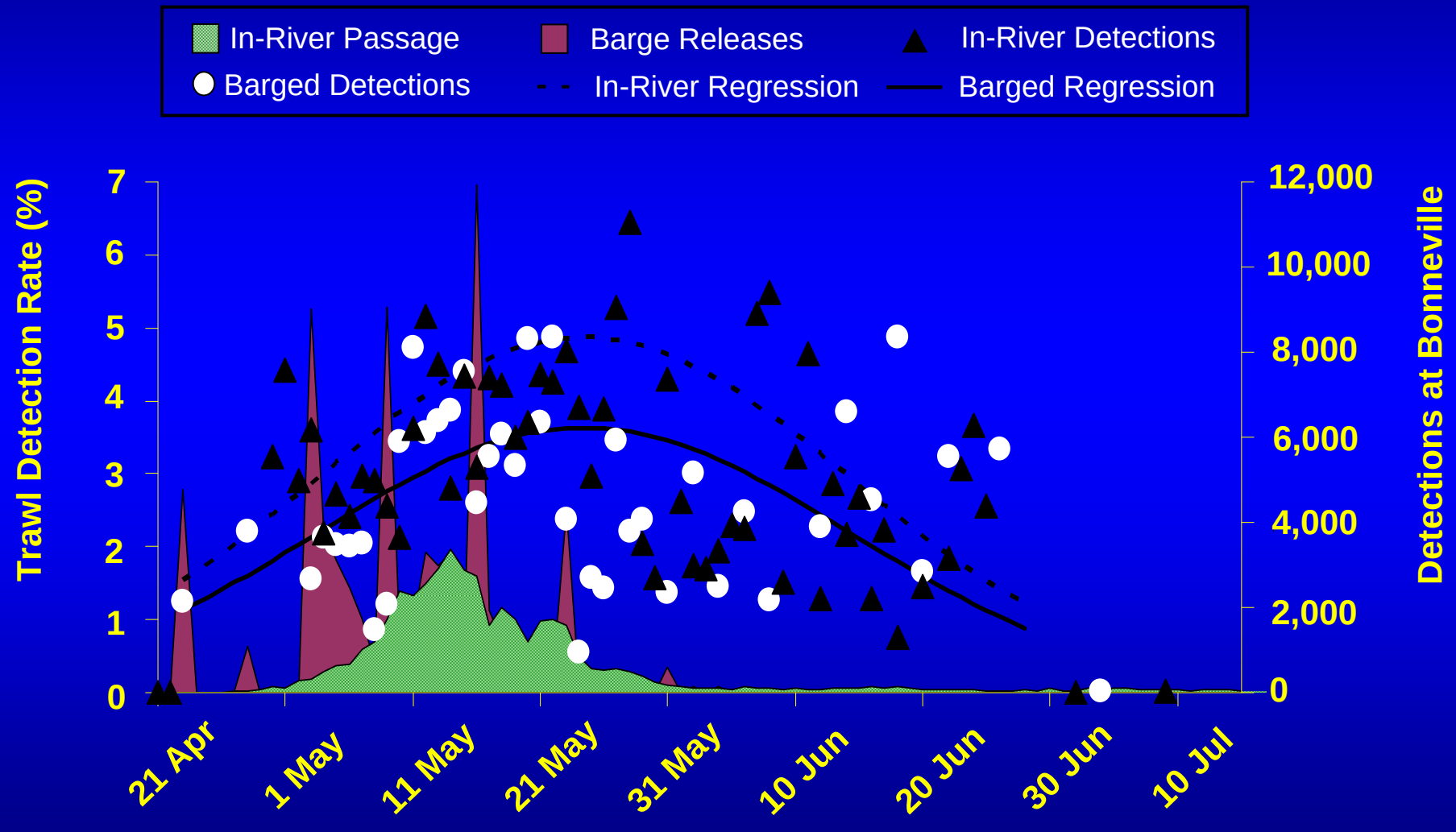
Mean Hourly Detections, 2007



Travel Speed Bonneville Dam to the Estuary for Yearling Chinook Salmon

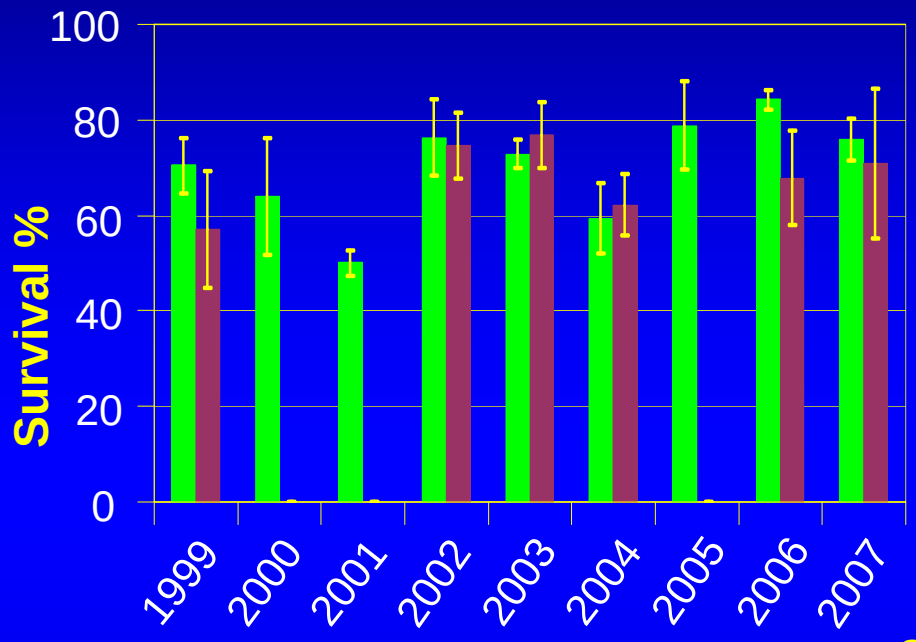


Estuary Detection Rates of Yearling Chinook Salmon



Survival (SE) from McNary to Bonneville Dam

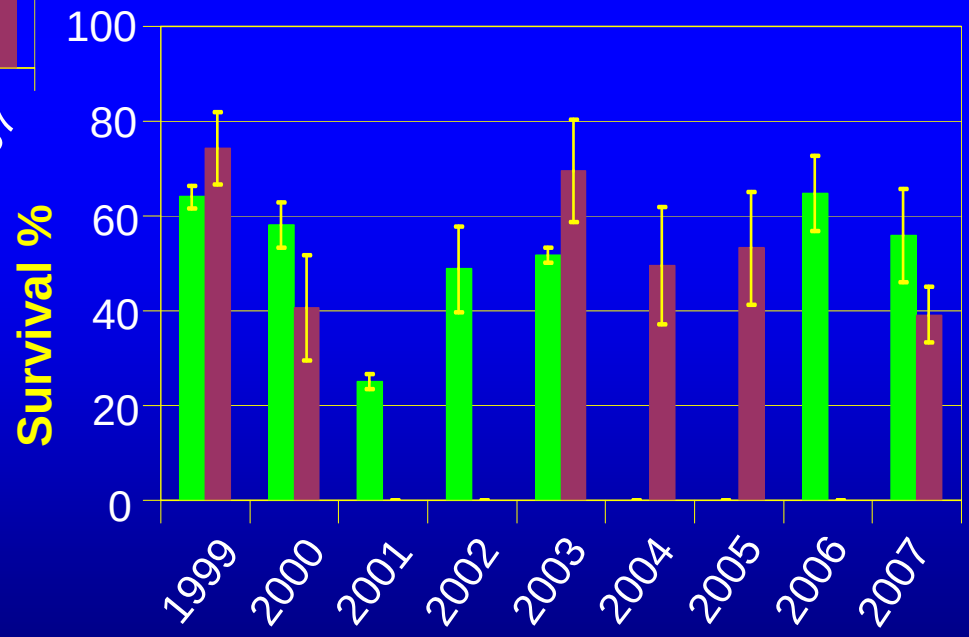
Yearling Chinook salmon



Snake River stock

Upper-Columbia stock

Steelhead



Seasonal weighted Averages from weekly estimates

Large Pair-Trawl Antenna Used in 2007

Fish passage tunnel

Front and rear coils for dual detections

Detection percentage of test tags passed through the center of each coil = 74 to 85%*

* Properly tuned system reads over 95% of these same tags when passed within 8” of antenna wall.

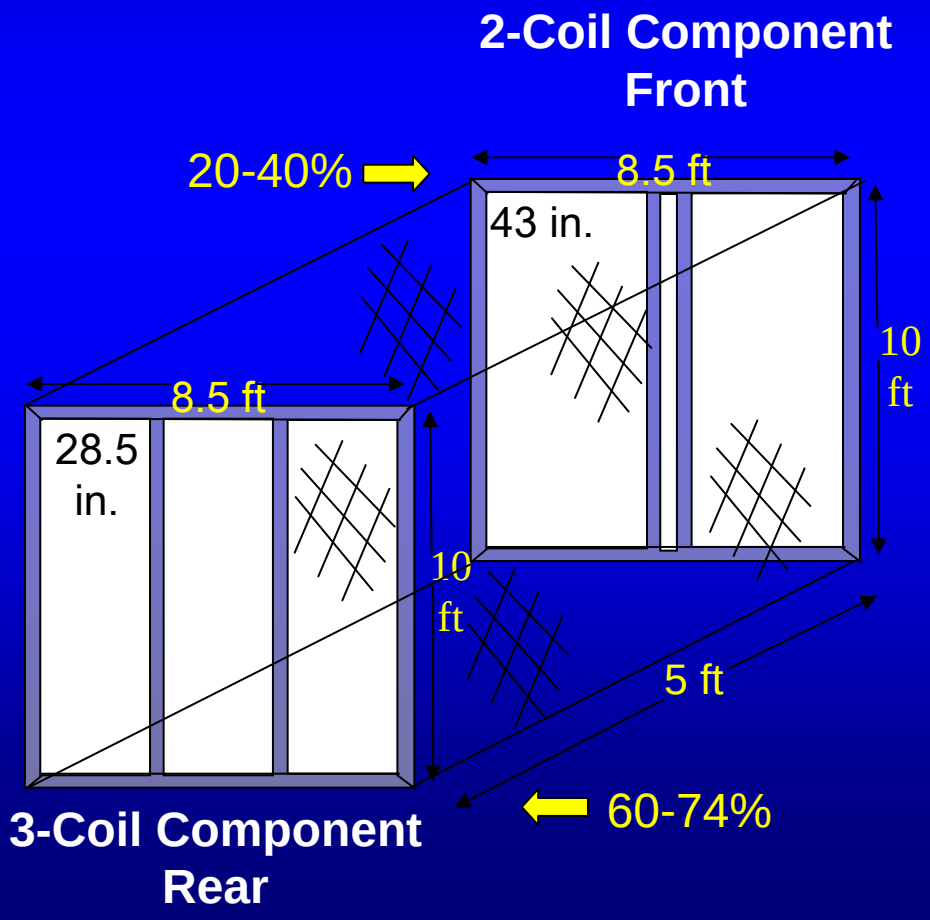
“RV Electric Barge”

Photo curtsey

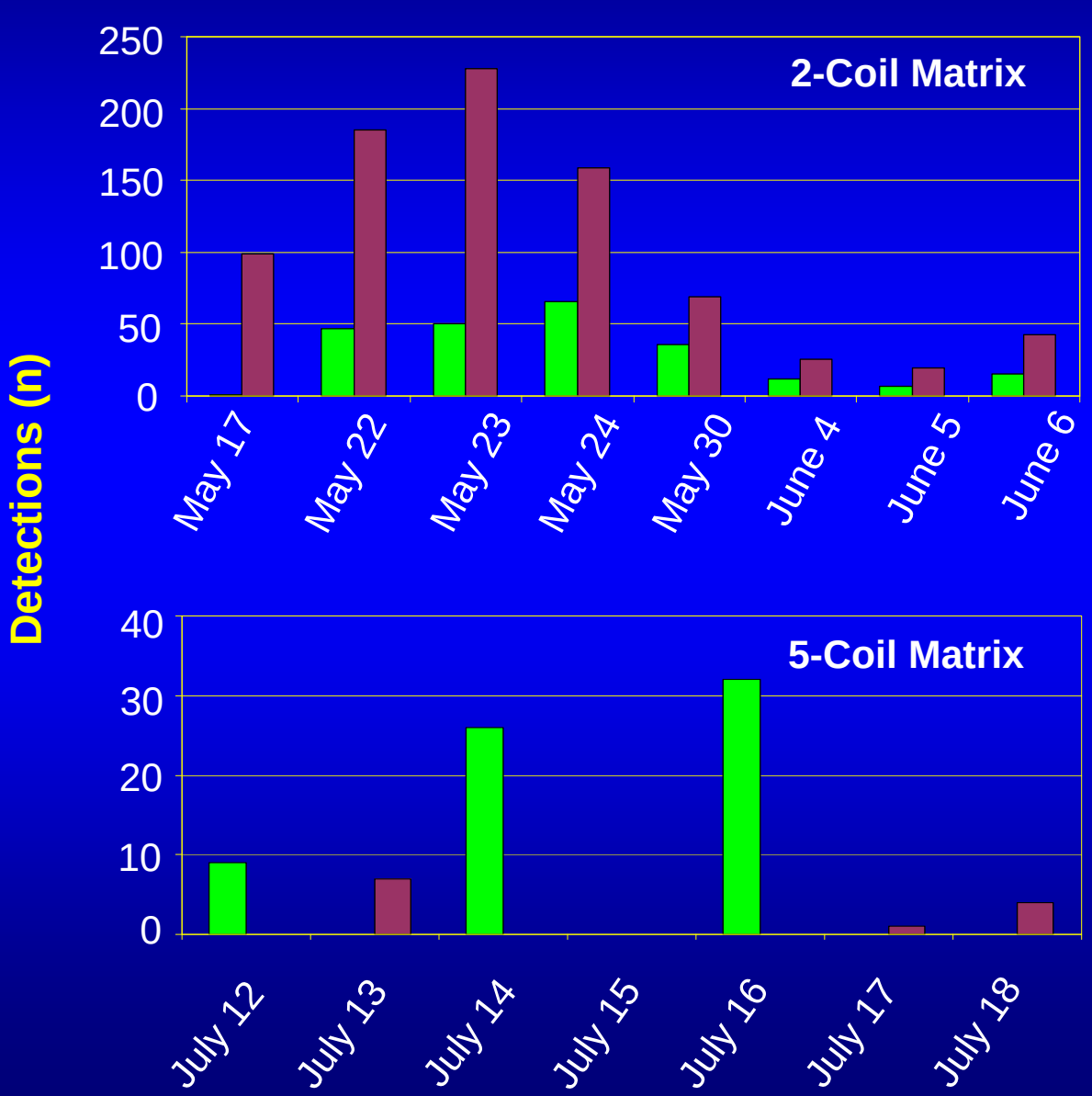
US Coast Guard, Group Astoria

Matrix Antennas Used in 2007

Detection percentage of test tags passed through the center of each coil



Matrix vs. Large Trawl Detections



Matrix System*

Large Trawl System

Antenna On-Time

= 40 hr 13 min

Total Detections

Matrix = 234

Large Trawl = 829

Antenna On-Time

Matrix = 16hrs 23min

Large Trawl = 16hrs 5min

Total Detections

Matrix = 67

Large Trawl = 12

Summary--survival

- Survival for in-river migrants from Lower Granite Dam to Bonneville Dam in 2007 was similar to 2006, despite much lower flow volume in 2007; 59% and 39% yearling Chinook salmon and steelhead, respectively.

- Survival from McNary Dam to Bonneville Dam in 2007 for upper Columbia River yearling Chinook salmon (71%) was higher than in recent years when estimates were possible but lower than for Snake River source fish (76%).

- Survival from McNary Dam to Bonneville Dam in 2007 for upper Columbia River steelhead (39%) was considerably lower than for Snake River steelhead (56%) and lower than in recent years when estimates were possible for these stocks (range 41% to 70%).

Photo courtesy US Coast Guard, Group Astoria

Summary—sample efficiency

- Detection rate in 2007 was higher than in any previous year (3.4% of fish previously detected at Bonneville Dam).

- The enlarged Matrix antenna system has the potential to greatly increase sample efficiency through reduced drag and increased tow speed (nearly double). We will test a 6-coil Matrix (3 front and 3 rear coils) and possibly switch to that system entirely in 2008.

Photo courtesy US Coast Guard, Group Astoria

Acknowledgements

Walla Wall District Corps of Engineers—Scott Dunmire

Bonneville Power Administration—John Piccininni

Sampling and technical crews

Photos courtesy US Coast Guard, Group Astoria